AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listing, of claims in the application:

Listing of Claims:

1. (Currently Amended) A device for producing a radioisotope from a target fluid irradiated with a beam of accelerated charged particles, the device including a circulation circuit comprising:

an irradiation cell comprising a metallic insert which includes a cavity which receives the target fluid and an inlet and an outlet which permits inflow and outflow of the target material, wherein the inlet and outlet provide an essentially turbulent vortex in the flow of the target fluid inside the cavity;

a pump effective for generating flow of the target fluid and circulating the target fluid inside the circulation circuit;

an external heat exchanger; and

a pressurizing device which pressurizes the circulation circuit,

wherein the pump and the external heat exchanger form an external cooling device effective for cooling the target fluid and configured to retain the target fluid inside the cavity during irradiation essentially in the liquid state,

the metallic insert further comprises an irradiation window which is substantially planar and positioned perpendicularly to the accelerated charged particle beam,

the inlet having a central axis generally perpendicular to the substantially planar irradiation window, and the inlet configured to direct the target fluid inflow (1) perpendicular to the irradiation window and (2) to an impact point of the accelerated

charged particle beam in the irradiation window so that the inflow hits the window head-on with the beam.

2. (Previously Presented) The device according to claim 1, wherein the pump is configured to provide a flow rate sufficient to keep the target fluid at a mean temperature below 130° C.

3. (Previously Presented) The device according to claim 1 wherein the pump is configured to provide a flow rate greater than 200 ml/minute.

4. (Previously Presented) The device according to claim 3, wherein the pump is configured to provide a flow rate greater than 500 ml/minute.

5. (Previously Presented) The device according to claim 1, wherein the cavity is configured to contain a volume of target fluid of between 0.2 and 5.0 ml.

6. (Previously Presented) The device according to claim 1, wherein the overall volume of the target fluid in the circulation circuit is less than 20 ml.

7. (Canceled)

8. (Withdrawn - Previously Presented) The device according to claim 1, wherein one of the inlet or the outlet is positioned essentially tangentially to the cavity.

9. (Withdrawn - Previously Presented) The device according to claim 1, wherein the inlet and the outlet are located at the lateral surface of the cavity on the same meridian.

10. (Canceled)

11. (Previously Presented) The device according to claim 1, wherein the cavity has a central axis around which a lateral surface is developed, the outlet being connected to the lateral surface and the inlet being along the central axis.

12. (Previously Presented) The device according to claim 1, wherein the irradiation cell further-comprises an internal cooling device effective for cooling the target material.

13. (Withdrawn - Previously Presented) The device according to claim 12, wherein the internal cooling device comprises a double-walled jacket surrounding the cavity.

14. (Previously Presented) The device according to claim 12, wherein the internal cooling device provides indirect cooling of the cavity.

15–20. (Canceled)

21. (Previously Presented) A method for manufacturing a radiopharmaceutical compound, the method comprising utilizing the device according to claim 1.

22. (Previously Presented) The device according to claim 3, wherein the pump is configured to provide a flow rate greater than 1000 ml/minute.

23. (Currently Amended) A device for producing a radioisotope from a target fluid irradiated with a beam of accelerated charged particles, the device including a circulation circuit comprising:

an irradiation cell comprising a metallic insert which includes a cavity which receives the target fluid, the cavity being closed by [[an]] a substantially planar irradiation window, and the cavity having at least one inlet and at least one outlet which permit inflow and outflow of the target material, ~~wherein~~ the inlet having a central axis generally perpendicular to the substantially planar irradiation window, the inlet is configured and arranged ~~so that~~ to direct the target fluid inflow ~~is directed~~ at an impact point of the accelerated charged particle beam in the irradiation window so that the inflow hits the window head-on with the beam and which inlet directs the target fluid inflow perpendicular to the irradiation window;

a pump configured to generate flow of the target fluid at a rate greater than 200 ml/minute and circulating the target fluid inside the circulation circuit;

an external heat exchanger; and

a pressurizing device for pressurizing the circulation circuit,

wherein the pump and the external heat exchanger form an external cooling device ~~effective for cooling~~ which cools the target fluid and which external cooling device is configured to retain the target fluid inside the cavity essentially in the liquid state during irradiation, and

wherein the pump provides a flow rate effective for providing an essentially turbulent vortex in the flow of the target fluid inside the cavity and the inlet and outlet of the

cavity provide an essentially turbulent vortex in the flow of the target fluid inside the cavity.

24. (Previously Presented) The device according to claim 23, wherein the pump is configured and arranged to provide a flow rate sufficient to keep the target fluid at a mean temperature below 130° C.

25. (Previously Presented) The device according to claim 23, wherein the pump is configured and arranged to provide a flow rate greater than 500 ml/minute.

26. (Canceled)

27. (Withdrawn - Previously Presented) The device according to claim 23, wherein one of the inlet or the outlet is positioned essentially tangentially to the cavity.

28. (Withdrawn - Previously Presented) The device according to claim 23, wherein the inlet and the outlet are located at the lateral surface of the cavity on the same meridian.

29. (Canceled)

30. (Previously Presented) The device according to claim 23, wherein the cavity has a central axis extending from the window to the second wall portion, the outlet being connected to the lateral wall portion and the inlet being along the central axis.

31. (Previously Presented) The device according to claim 23, wherein the irradiation cell further comprises an internal cooling device effective for cooling the target material.

32. (Previously Presented) The device according to claim 1, wherein the cavity has a volume of at least 5 ml.

33. (Previously Presented) The method according to claim 21, wherein the cavity is configured to contain a volume of target fluid of between 0.2 and 5.0 ml.

34. (Previously Presented) The method according to claim 21, wherein the overall volume of the target fluid in the circulation circuit is less than 20ml.

35. (Previously Presented) The method according to claim 21, wherein the pump is configured and arranged to provide a flow rate sufficient to keep the target fluid at a mean temperature below 130°C.

36. (Previously Presented) The method according to claim 21, wherein the pump is configured and arranged to provide a flow rate greater than 500 ml/minute.

37. (Previously Presented) The method according to claim 21, wherein the pump is configured and arranged to provide a flow rate greater than 1000 ml/minute.